

SMOKING ARTICLES

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application is a division of copending U.S. Application No. 09/582,232 filed July 24, 2000.

BACKGROUND OF THE INVENTION

[002] This invention relates to smoking articles such as cigarettes, cigars and cigarillos, and is concerned with the reduction of sidestream smoke from smoking articles. Sidestream smoke is that which is produced when the article is alight but not being drawn on by the smoker. Mainstream smoke is that which is generated when the smoking article is drawn on by the smoker; the chemistries of mainstream and sidestream smokes are different.

[003] Sidestream smoke is perceived to be annoying to non-smokers, especially when a cigarette is left lying as for example in an ashtray, and any reduction in it is desirable. The modification of mainstream smoke affects the perception of the article by the smoker.

[004] The present invention uses activated carbon to modify the smoke of a smoking article. Of course, activated carbon has been used in smoking articles, and for various purposes, virtually ever since its excellent adsorbent properties became known.

[005] For example, the effects of various carbon contents of filters have been investigated by Williams et al in a report presented to the 5th General Assembly of CORESTA, Vienna, October 1964 and reprinted in Beitrage zur Tabakforschung, Vol. 3 part -3, pages 233-242. This showed varying adsorbence of different constituents of mainstream smoke by filter shreds of different make-up. However we are concerned with placing of carbon in the tobacco rod; that is, where it is subjected to conditions very different from those in a filter.

[006] GB-A-15123S2 shows the use of activated porous particles of carbon adhered to tobacco in the tobacco rod to affect mainstream smoke. GB-A-1348580 shows a sheet of reconstituted tobacco material containing activated carbon used as a main material for making cigarettes which gave a reduction in particulates and nicotine in mainstream smoke.

[007] As far as we are aware at present the only disclosure of the use of carbon in a tobacco rod in a situation where reduction of sidestream smoke was aimed for is in US-A-5092353 (EP-A-378774). However the aim in that disclosure was to reduce sidestream smoke by the use of wrapping paper of very low permeability (< 10 CORESTA units). To compensate for the tendency this will cause for the cigarette to be self-extinguishing, pyrolyzed alpha-cellulose was present in the tobacco rod.

[008] This pyrolyzed material was not subjected to any activating treatment. No mention is made of any chemical effect it might have on the smoke, and it probably has little or none because in the specific example the pyrolyzed material was cotton linters, which would give a comparatively low surface-area carbon.

SUMMARY OF THE INVENTION

[009] The present invention, therefore, is contrasted with all of this prior art by providing in a tobacco rod an activated carbon for having an effect on the chemistry of smoke while not being limited to the use of low permeability papers, and specifically not to papers of < 10 CORESTA.

[010] Furthermore, the present invention provides the addition of activated carbon in specific particulate form in reconstituted tobacco sheet to the tobacco rod of the smoking article in such a way that greater mildness of the smoking article is perceived by the smoker in the

mainstream smoke, and at the same time there is a reduction in sidestream smoke over a wide range of porosities of the wrapper of the article and in particular with porosities high enough that special precautions do not have to be taken to prevent self-extinction of the article.

[011] Furthermore, the activated carbon particle should preferably be of vegetable origin since they will then contain minute traces of metals, which assist in the firm adsorption of (particularly) aldehydes from the smoke and indeed may chelate with such compounds. These are compounds the removal of which is particularly critical for improving mildness of perception of the article when smoked.

[012] At the same time, however, the activated carbon does not diminish and may even increase certain beneficial volatile components of the smoke.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[013] It is important to realise that as the "coal" of the smoking article progresses along the article, smoke components adsorbed by the particles are displaced from those particles minimally if at all. They are destroyed to gaseous oxides together with the material of the carbon particle itself by the extremely high temperatures (reaching up to about 8000C) generated in the coal.

[014] The reconstituted tobacco sheet containing the activated carbon particles may be made by conventional techniques for making such sheets, which in their turn resemble conventional paper-making techniques, the sheet then being shredded for incorporation with shredded tobacco which will be the material of the tobacco rod.

[015] An important application of the present invention however will be in "roll your own" tobacco blends, i.e. those which are sold loose and which are wrapped in cigarette papers

by the smoker.

[016] The invention therefore includes within its scope a blend of shredded tobacco and of reconstituted tobacco sheet with the latter containing activated carbon.

[017] The handling of the sheet, whether in shredding or in later manipulation either in a machine or by the smoker, may cause loss of carbon particles and the reconstituted tobacco sheet may be coated or sized in order to assist retention of the particles in it, and in particular the particles may themselves be micro-encapsulated before incorporation. This latter has the advantage of increasing the size of the particles and therefore their retention mechanically and the uniformity of size but, perhaps surprisingly, does not affect their activity.

[018] Example 1: Cigarettes were made from a mixture of US flue-cured and Burley tobaccos, cut rolled stem and expanded tobaccos, processed and cut to 32 cuts per inch ("cpi"). Incorporated in the shredded tobacco were 20% of a reconstituted tobacco sheet equally cut and containing 30% of activated carbon particles from coconut, of mean particle size 37 μm and ranging in particle size from 0.5 μm to 150 μm . Control cigarettes were made identically but with the omission of the activated carbon particles.

[019] The cigarettes were 84 mm long, 7.9 mm diameter, unfiltered. The wrapping was an 80 CORESTA flax-based paper, with 2% potassium citrate burn enhancer.

[020] The cigarettes were subjected to smoking on a standard smoking machine and the mainstream smoke was analysed for vapour phase and semi-volatiles content with the results shown in Tables I and 2.

[021] As seen in Table 1, there was a striking diminution, selective in character, of certain aldehydes and ketones and in particular of acrolein and butyraldehydes, the removal of

which is important for mildness of taste. On the other hand, there was an actual increase as compared to the standard in certain ingredients, and in particular limonene, which are regarded as beneficial to the taste.

[022] A similar reduction though less selective is X seen in the semi-volatiles as shown in Table 2.

[023] Example 2: Cigarettes and controls were prepared using the same tobacco blend and reconstituted tobacco sheet as in Example 1, but using respectively papers of 25, 50, 80 and 180 CORESTA units porosity. Sidestream smoke from the inventive cigarettes and from the controls had significant reductions both in semi-volatiles and in nicotine content, as seen in Table 3. Increased carbon monoxide and carbon dioxide production is assumed to be due to the presence of the particulate carbon in the tobacco sheet.

[024] What is claimed is: